5. Particulate Matter (TSP, PM_{10}, and $PM_{2.5}$)

Particulate matter refers to a mixture of solid particles and liquid droplets found in the air. Particles are classified by their size:

- Total Suspended Particulates (TSP) are airborne particles up to 100 micrometers (μm) in diameter.
- Coarse particles, or PM_{10}, are those with diameters up to 10 μm.
- Fine particles, or $PM_{2.5}$, are those with diameters up to 2.5 μm.

These categories are not mutually exclusive. For example, TSP also includes coarse and fine particles. The EPA no longer regulates TSP particles over 10 μm, because it doesn=t consider them to be a general health risk. However, North Carolina regulates TSP as a nuisance pollutant.

Sources

Particulate matter comes from various man-made and natural sources. Man-made sources include diesel trucks, power plants, wood stoves and industries. Some smaller particles are formed from gaseous pollutants. Natural sources include wind-blown dust, forest fires, volcanic eruptions and plant pollen. The chemical and physical composition of particles can vary widely. While individual particles cannot be seen with the naked eye, collectively they can appear as black soot, dust clouds, or gray hazes.

Fine particles can remain suspended in the air and travel long distances. For example, a puff of exhaust from a diesel truck in Los Angeles can end up over the Grand Canyon. In fact, one third of the Grand Canyon haze comes from Southern California. Factors that affect the dispersion of particulate matter and the distance it travels include wind, humidity, and the size, shape, and density of particles. The stability of the atmosphere near a pollutant source determines the dispersal pattern of the emissions. In addition, rain can wash particles from the atmosphere.

Effects

Particulates can cause adverse health effects, particularly breathing disorders. The finest particles easily can reach the deepest recesses of the lungs. Those most at risk are the elderly, children, asthmatics, and individuals with pre-existing heart or lung disease.

A major economic effect of particulate pollution is the soiling of vehicles and buildings, which can be costly to clean and maintain. Acidic particles also can accelerate building deterioration. Particulate matter can also interfere with plant photosynthesis, by forming a film on leaves that reduces exposure to sunlight. These are some of the reasons why North Carolina has kept its TSP standard.